

Discussion on "The Ladder Spoke Resonator at INFN Legnaro" by Giovanni Bisoffi

Bisoffi presented the results of the design work for a box-shaped 3-spoke resonator with a ladder arrangement of spokes. Due to the presence of flat walls he was asked about potential multipacting in this type of structure. Bisoffi said that no simulations have been done so far. But he pointed out that this cavity topologically is similar to the Legnaro superconducting RFQ that showed low level multipacting, which could easily be processed during start-up.

He also confirmed their plan to have huge demountable side walls that allow good access for cleaning the inside of the cavity.

Delayen asked about the relation of the field flatness inside the cavity and the fact that all gaps are of equal length. Bisoffi explained that the field flatness is set by the shape of the taper on each individual spoke. Delayen pointed out that this only works due to a weak cell-to-cell coupling, similar to that in elliptical cavities. Structures with strong coupling require halfcells at the ends. The effect of the individually shaped spokes means that the endcells and the midcells have different frequencies. This means strong variation of the field flatness with endcell tuning.

Pagani stated that implementation of structures is of lesser importance. In the end voltage gain, transit time factor and peak fields are what counts. Bisoffi confirmed that except for the shunt impedance all RF-parameters are in line with other designs. The main motivation for investigating the ladder structure is the potential to have better access to the cavity interior for cleaning.